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ABSTRACT

This paper discusses the history, development, and impact of the curriculum reform movement from 1950 to the present. It explores criticisms and accomplishments, outside influences, and the current possibilities of reform. Beginning with rumblings of dissatisfaction in the early fifties, the movement grew into a full reform of science education and later social studies and English. The major emphasis was on curriculum materials improvement and teacher training projects. By the mid-sixties teaching style and classroom strategies became important, broadening into concern in teaching children how to think. In 1965, national curriculum projects were relegated to regional education laboratories and research and development centers. The movement has made little long-term impact on schools, if one analyzes continued use of content and teaching strategies, or change in teacher classroom practice and student learning patterns. The main accomplishments are twofold: a technological breakthrough in course design resulting in a body of work ready for use, and a good training ground for curriculum developers, teachers, and academic disciplinarians. Curriculum development and current reform is limited by shifting national priorities and the purposes of education. Greater impact is possible if reform is locally instigated and change is demanded by the public. Curriculum developers need to continue to develop techniques and gather evidence as to their success. (CK)

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STABILITY AND REFORM IN RECENT AMERICAN CURRICULUM

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From the 1950's through much of the 1970's we participated in a major effort to change curriculum in American schools. It was national in scope and motivated primarily by a concern for the quality of science education. Compared to the magnitude of the effort, it seems to have had little enduring effect on the quality of education--even of science education. The completion of two sets of documents make this an especially appropriate time to review this curriculum reform movement. One set came from the search by the National Institute of Education for its proper role in curriculum development.[1] The other reflects a similar concern by the National Science Foundation and is composed of a set of case studies, three literature reviews, and a national survey.[2]

In trying to understand causation we may violate the muse of history. We are trying to analyze and explain events in which we were actors. Nicholas was the director of the High School Geography Project. Suzanne was co-director of the Econ-12 project and continued her association as senior author of the commercial version published by Addison Wesley, Economics in Society.

We recognize the varieties of meaning of the term curriculum. We use it in this paper both in its narrow sense, the subject matter content sequenced in a given course, and in its wider sense, wider in the inclusion of the whole range of subjects through the several age levels, and wider in the inclusion of all the

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components which make up a teaching-learning system--students, teacher, text, other instructional materials, teacher guides, teacher training, classroom procedures, and learning setting.[3]

The Beginnings of Postwar Curriculum Reform

In the 1950's there grew a profound dissatisfaction about education. Low performance on military qualifying examiuations by such a large number of draftees during the war became a pervasive reminder of education failure. Arthur Bestor, Illinois historian, wrote Educational Wastelands: The Retreat from Learning in our Public Schools, an early polemic in what was to be called "The Great Debate."[4] The Sabertooth Curriculum , satirizing the survival of obsolescent subjects in schools, was widely read.[5] Why Johnny can't read was a best seller in 1955.[6] Admiral Rickover, fresh from his successful battle with the Navy over the atomic submarine and a popular folk hero, harshly criticized laxity in pbulic schools.[7] The progressive education and core curriculum movements spawned by John Dewey came increasingly under attack. The painstaking research on the effectiveness of progressive education and the core curriculum, the eight-year study, were ignored.[8] Distortions of Dewey's philosophy were held up as strawmen to be attacked by the champions of intellectual rigor and traditional disciplines.

Within this atmosphere of intellectual discontent many beginnings of curriculum reform were sprouting. Individuals and schools systems, universities and research centers, foundations and government agencies all played their parts. The Contra Costa County (California) Department of Education (an intermediary between local school districts and the State Department of Education) in association with Hilda Taba at San Francisco State College, started research and development of an

elementary social studies curriculum in 1954. It was financed partly by a research grant from the U.S. Office of Education Cooperative Research Program and partly by the County Department of Education as an attempt to provide curriculum guides and consulting services for its schools.

The larger private foundations came into curriculum reform early and remained to provide initial funding for many groups, and selectively to support promising but unproven ideas. In 1951 the Carnegie Foundation supported the earliest work in mathematics: the University of Illinois Committee on School Mathematics (UICSM), under the dynamic leadership of Max Beberman. The Ford Foundation set up a semi-autonomous Fund for the Advancement of Education which helped several groups get started.

In 1958 Lawrence Senesh, a Purdue University economist, began developing an elementary social studies curriculum, on the world of work with support from the Elkhart, Indiana School District and a local business man. The Joint Council on Economic Education, organized in 1947, raised money from private business to finance a network of regional councils and a national headquarters in New York, to begin its work upgrading teachers' economic background and to support local curriculum development.

But the major investment in changing American school curriculum came from

the federal government through two agencies: the National Science Foundation (NSF) and the Department of Health, Education and Welfare (HEW), of which the Office of Education (USOE) was the unit concerned with education until 1972 when research and curriculum functions were transferred to the newly created National Institute of Education (NIE).

Other federal agencies were also significant. Military education within the Department of Defence had pioneered programmed instruction and the teaching of language by conversational methods. Military use of system design methods in education came to the attention of education research circles through the writings of Robert Gagné and others. In addition, the Space and Atomic Energy agencies were to develop programs to interest students in their missions and in the science necessary to further develop space exploration and nuclear power. While the U.S. Office of Education had had experience in vocational education since 1917 in agriculture, home economics, wood and metal shops, it was NSF which pioneered the major post World War II curriculum reform movement.[9]

The economic conditions of the 1960's provided an important backdrop and set of necessary conditions for the growth of a grants economy support of curriculum reform. While the 1960's started out with only mediocre economic performance, it represents one of the most rapid and sustained growth periods in U.S. history. Second, ~~the~~ education ~~industry, to describe education in its economic dimension~~, was enjoying rapid growth, both from growth in enrollments, and from the demand for training to sustain economic growth.

When John Kennedy took office in January, 1961, launching the "New Frontier" with his bevy of the "best and the brightest", the economy was in the process of recovering from the 1957-58 recession, one of the minor slumps in economic activity experienced since 1946. Economists and politicians in 1960 believed

in the basic growth potential of the U.S. economy and in the effectiveness of Keynesian economic policies in eliminating all but a slight murmur of the business cycle. Federally financed defense spending, foreign aid, public works construction, welfare and social programs could be orchestrated so as to meet national priorities and provide the necessary injections of new aggregate demand at appropriate times. The underemployed but growing economy inherited by Kennedy could well afford fiscal stimulation to support important aspects of the new frontier.

At the local level, even though the postwar baby boom was beginning to slow down, school enrollments were still growing. In growth regions like the South, Southwest, West, mountain regions, new schools were popping up with the new and growing communities which had more than adequate tax bases for their schools. ~~Urban blight and flight, while existant, had not been discovered~~. The big, older eastern cities had not yet started to experience the fiscal crisis effects of migration. Many school systems were in the mood to experiment and had some financial flexibility to do so.

NSF Curriculum Improvement Efforts

Within the National Science Foundation there was overt concern about quality of education. Since its early years summer institutes for college and university teachers had been a part of NSF's efforts in upgrading science. In 1954 summer institutes were organized for high school teachers.[10]

It is reported that Jerrold Zacharias had been complaining about the terrible state of secondary school physics when Harry Kelly, director of the NSF Education Office, challenged him saying essentially; 'If you're correct and the physics teacher doesn't know physics nor how to teach it and are not up-to-date, then whose fault is it? They learn their physics from you guys in the Colleges and Universities. What are you going to do about it?'[11]

Zacharias took the challenge, and so on the next trip to Washington proposed the first stage of Physical Science Study Committee (PSSC) effort: the series of films which were to be available to physics teachers. The hope was that the teachers of physics would show the films to their classes and learn a more profound understanding and more up-to-date material, at the same time that they taught.

Biologists at the same time, under the aegis of the American Institute of Biological Science and the leadership of Bentley Glass, were beginning to explore ways to improve the teaching of Biological Sciences in secondary schools.[12] They were particularly concerned at the absence of evolution, genetics and human reproduction from the commonly used texts.

These seedlings had already sprouted in the fertile soil of intellectual discontent about education when Sputnik silently circled the earth and exploded America's smug belief in its scientific and technical pre-eminence. It's hard to be emphatic enough about the impact of Sputnik. It came completely without warning to most Americans. That the Soviets had the resources, the trained personnel and - most shocking of all - the creativity to put a satellite in orbit while we were still fussing with ballistic missiles, was incredulous. The surprise and fear opened the floodgates of federal appropriations for science, including science education. Money was available for scientists and mathematicians who wanted to try to change education.

For this phase of curriculum development in the late 1950's, and early 1960's, National Science Foundation involvement had another powerful and necessary function: it provided an aura of prestige to involvement in

curriculum reform. Mature scientists could afford to take a summer or a semester away from research to share his (her) insights into, and mastery of, the discipline. Others could serve on advisory and steering committees. It became a proper part of one's patriotic contribution and one's service to the discipline.

NSF efforts to change pre-college science education can be broadly categorized into teacher training institutes and curriculum materials improvement projects. It was the national curriculum project which seemed like a new institution, the key to open the classroom door to change.

Through fiscal 1969 NSF supported 77 elementary and secondary school projects including mathematics, physics, chemistry, biology, astronomy, atmospheric and earth sciences, anthropology, geography and sociology. In the 12 years 1957-1969 NSF invested almost 100 million dollars in 'course content improvement' at primary and secondary levels.[13] The cumulative total through 1976 was 117 million dollars.[14]

There was a good deal of experimentation among the NSF projects at first, trying to find a cost effective way to change what goes on between teacher and student. Most of the concerned scientists had had no experience in school rooms below the university level since they graduated from high school themselves. Characteristically conferences of scientists, high school teachers and administrators worked out what was to be done. From among those involved a project was organized. Initially projects were in the Natural sciences and Mathematics and at the secondary school level. Characteristically they were supported by grants over several years - made to a non-profit institution, supervised by an advisory or steering committee dominated by members of the scholarly discipline(s). The staffs were scientists, teachers and education specialists, writers and editors and a variety of supporting secretaries, illustrators, media specialists and the

like. The project staff coopted additional scholars from the disciplines and teachers to write, rewrite, test and revise curriculum materials to be published by a commercial publisher for use in an established course in a nationwide market (and sometimes to be translated for an international market). Whether or not the materials were adopted widely in schools, it was hoped that they would be imitated by other authors and publishers.

One pattern of operation, used by the Biological Sciences Curriculum Study (BSCS) and the Earth Science Curriculum Project (ESCP), brought dozens of scientists and teachers together for a summer of intensive writing and editing. The outline had been established ahead of time and each team wrote a portion for which it was best qualified. Rewriting, editing and illustrating were carried out at a feverish pace in a heady atmosphere of self-sacrifice for the greater glory of American education. The tentative draft was printed in time for school trials that fall and winter.

The project staff worked through the year supervising the trials, preparing for the next summer's intense rewriting, moving toward the final publication of the finished versions. Early fears of the National Science Foundation going into the textbook business were assuaged by contracting the final publishing of most project materials to commerical publishers already in the textbook business. Royalties which would normally have been paid to authors were paid to the U.S. Treasury. In the early 1960's projects were funded at the elementary school level and in some of the social sciences.

Projects working on a smaller scale did more of the invention and writing "in house". The Anthropology curriculum Study Project, for instance, was not writing for a well established course and was not enthusiastic about a "text" in any case. The staff developed several units of inquiry materials, tried had them in classrooms, revised them themselves.

The High School Geography Project (HSGP) and the Sociological Resources for Secondary Schools (SRSS) used a sub-contracting technique. A University geographer or sociologist would take full or part-time off from normal duties to develop a "unit" or "episode" in his area of expertise within the discipline. He or she would work with teachers and other educational specialists - especially testers - to develop the material, have it tried in a few classrooms and revise it in the light of the trials. The materials were then turned over to the project staff for wider trials and further revision.

Earlier efforts were content to improve the content of the textbook, but by the middle of the 1960's the projects were concerned with the teaching style and classroom strategies as well as with the accuracy, completeness and up-to-dateness of the content. The elementary school natural science projects had emphasized the process of science and the development of cognitive skills, within a developmental model of the child's cognitive development. Jerome Bruner's "The Process of Education" which came out of a conference of curriculum developers at Woods Hole, Massachusetts in 1959, was so widely read that it was jokingly referred to as "The Gospel According to St. Jerome"[15]. We remember it for its emphasis on inquiry, on the importance of the "inductive leap" and the intrinsic satisfaction involved in participative learning, the practicing of cognitive skills, the importance of the structure of the discipline in teaching a subject matter, the claim that one can teach any idea at some level of sophistication to any child.

There was considerable communication among projects. The Foundation brought project directors together at least once a year. They listened to NSF policy but also reported to each other and discussed mutual concerns. Boulder, Colorado, Metropolitan Boston, Mass., and San Francisco California all had several projects where sharing of experience were easy.

There was also communication with Office of Education projects in the social sciences and social studies in which the concern for the learning process as well as the content had always been high. A group of eminent social scientists, some of them curriculum developers, in the Middle West had formed themselves into the Social Science Education Consortium and secured NSF financing especially to increase the flow of information. It is clear that in less than a decade the prevailing opinion within NSF projects had shifted from an overwhelming concern with content to a mixed concern for both the quality of the content and the way it was to be taught. The curriculum developers might still have been writing their objectives in narrow behavioral terms, but they were motivated by the hope of changing students' attitudes. They hoped students would internalize the spirit of science, would understand the value of scepticism, would be moved by the love of learning.

Two pieces of personal evidence will help to illustrate the origins of this 'love of learning' aim. Helburn of HSGP ascribes his initial commitment to inquiry teaching to his own elementary school experience. He was a product of Shady Hill School, a highly successful private progressive school in Cambridge, Massachusetts. He remembers the excitement of his own primary and junior high school learning. He saw no reason why, with effort, intelligence and good will, challenging curriculum material wouldn't diffuse throughout the system.

In 1964, early in his association with the Project he made an appointment with Jerrold Zacharias, to learn what the 'Grand Old Man' of curriculum reform would advise an aspiring project director. Zacharias frittered away the first 40 minutes on speculations on how to get kids involved in seeing the earth from above, like a map. Then having set the younger man at ease with his humility asked: 'What makes you love geography? What makes me love physics?

That's what we need to find out and reproduce. We failed in producing PSSC physics. Sure, it is better physics than what was there before, but it doesn't make kids love physics.' He reached up on the shelf behind his desk and pulled down a slender soft covered teachers guide entitled 'The Behavior of Mealworms', gave it to Helburn with the admonition to study it for it was the best piece of curriculum developed thus far.

U.S. Office of Education Involvement in Curriculum Development

Two related political realities loom important in understanding the U.S. Office of Education's erratic involvement in curriculum development. First was USOE's concern about its image with the public schools and its scrupulous care in avoiding accusations of promoting or financing the development of a national curriculum. USOE's leadership recognized local control and responsibility for education is a cardinal principle which cannot be violated, at least not obviously. The second reality was the susceptibility of USOE programs to the vicissitudes of interest group politics. ~~As different interest groups have attempted to use national education programs to solve broader social justice problems~~, shifting political pressures have brought repeated re-organizations in Federal education agencies and abrupt changes in funding, all during a time of massive increases in the federal budget for education. ~~It is not inaccurate to suggest that Congressmen have been willing to use education as the arena for giving the poor folk 'a bit of the action'~~.

The Cooperative Education Act of 1954 and Title VII of the National Defense Education Act of 1958 both permitted USOE to fund curriculum development. At first, however, USOE restricted its activities to the legislative mandate of development of modern language materials and teacher training programs supportive of NSF curriculum projects. Only in 1961 did USOE get more widely in curriculum development and shift new monies into the area, first through Project English, then through Project Social Studies.[16]

The social studies projects overlapped with social science efforts at NSF and the contrasts in the two programs are worth mentioning. USOE followed a rather broad policy which incorporated several different approaches to curriculum change, some involving course development, some attempting broader scope-and-sequence revisions in the curriculum as a whole. Also, the USOE program opened up funding to social studies education professionals as well as to social science disciplinarians.[17] This more catholic approach led in turn to a broadening of the reform movement to include approached to social studies education which fit more closely traditional citizenship education objectives and to programs whose primary purpose lay in teaching children to think, even to think critically. For instance, at Harvard, Donald Oliver directed a project which developed course materials based on an analysis of public issues through case studies organized around five persistent social problems in which high school students learned to clarify their values using a jurisprudential model of conflict analysis. Hilda Taba and the Contra Costa County/San Francisco State team completed their elementary social studies program, teaching children of all ability levels the process of abstract thinking through the use of inductive teaching strategies imbedded in a spiral curriculum.

USOE involvement in sponsoring national curriculum projects was short lived. In 1965, with President Johnson in the White House promoting his War on Poverty, national education priorities shifted dramatically to a concern for ending poverty, partly through providing compensatory education to the previously deprived poor, minorities, handicapped. USOE reorganized to manage the massive funding provided by the Elementary and Secondary Education Act of 1965 and shifted out of general curriculum development. Instead it delegated curriculum work to the hinterlands, establishing a network of 17 Regional Education Laboratories and nine university-based Research and Development Centers.[18]

Dissatisfaction with the accomplishments of the Office of Education led in 1972 to the splitting off of the research and development functions into a new organization, the National Institute of Education. The R & D centers, the Regional Laboratories and the Educational Resources Information Center with its network of clearing houses became a part of NIE. A task force under the leadership of Jon Schafferzick made a thorough review of federal involvement in curriculum development. Many of the papers prepared for that task force have been useful in preparing this paper. Policy adopted after this review focuses NIE efforts, not on curriculum development but on research and on activities which may be supportive of others directly involved in curriculum development.[19]

Changing Curriculum Through Teacher Training

Another quite separate approach to improving what goes on in schools, involved the investment of federal funds in the education of teachers. Almost from the very beginning of its existence, the National Science Foundation had supported summer institutes for college and university faculty. The first tentative of the summer institute to secondary school teachers took place in 1954. It built on the long tradition of teachers returning to universities during the summer term while their own schools were closed. Federal funds paid faculty salaries, stipends for participants and usually included books, materials, travel, and overhead. The program grew rapidly.[20]

"Through 1965 approximately 150,000 'training opportunities' for teachers of natural science and mathematics had been provided, and it is believed that about a third of the estimated 226,000 people teaching natural science and mathematics in 1964-65 had been to at least one summer institute."[21] The U.S. Office of Education joined the summer institute bandwagon in 1958 after the passage of the National Defense Education Act, increasing the level of support as well as the breadth of subject matter eligible. The program

was popular with teachers who fit the institutes into their own personal plans, including additional degrees and often upward mobility out of secondary school teaching. It was popular with Congress, for members could point with pride to teachers and schools from their home districts who had been helped by Federal appropriations. But there was a disturbing evidence about how little change took place in classrooms. Many teachers never enrolled, crucially, older ones. There was a high turnover in the younger teaching labor force. What was learned was often inapplicable to the secondary classroom and the cost was enormous and seemingly unending. As in the case of curriculum development projects, the first institutes were concerned with content. Professors of a given subject were bringing teachers up-to-date on topics within their discipline. Teacher participants complained that there was little they could use in their classrooms.

As curriculum material became available from projects many institutes were organized specifically to train teachers to use them. Even then it was surprising how few teachers were using the materials the next year. School systems had not bought the materials, teachers were assigned to different courses, the physical facilities were inappropriate and on and on. Further adaptations included year-long institutes and summer institutes with follow-up sessions once a month through the year.

By the end of the sixties we were experimenting with Leadership Training Workshops. Workshops consisted of School District teams of two or three teachers, a department head, an administrator all from the same school system and a professor from a nearby college or university. The team would have a commitment from the school district that the materials would be available for use. During the summer they would spend their time learning to use the materials, and designing a dissemination strategy to be put into effect upon their return. We can vouch for the fact that the workshops were very exciting experiences. Morale was high.

Some of the teams stuck together and were successful in introducing the new materials within their home districts. But gradually the program wound down. With little evidence that the institutes and workshops actually changed teacher behavior or increased adoptions of the new curriculum packages, it was hard to justify continued investment. The dilemma was clear. To restrict institutes to NSF developed materials would leave the Foundation open to the charge of using its resources to promote a National curriculum. Leaving the competition open to any science education would not improve teaching in any demonstrable way and left the innovative curriculum materials unsupported by dissemination efforts. The Office of Management and Budget - a part of the President's office - finally forced the foundation to restrict institutes almost entirely to National project materials. When the blow up came in Congress, the foundation was vulnerable.

Impact of the Movement

The conflicting data on impact of the curriculum reform effort make evaluation of the effect of the movement difficult. Our assessment, based on our own experience in social studies, is that there has been little pervasive long-run impact on primary and secondary schools judged in terms of continued use, use of teaching strategies and the concommitant change in teacher classroom practice and student learning. That is, most schools haven't changed much as a result of the 60's reforms. However, data on text adoptions, particularly in the secondary science curricula, give a different story. They indicate that the secondary science projects have been widely adopted and that they influenced textbook content as competing publishers copied the national curriculum projects. Particularly the biologists claim great success. In 1976 Arnold Grobman, the first BSCS director, wrote, 'The BSCS programs in biology have been highly successful. Nearly 4.5 million copies of the three BSCS version textbooks have been sold to date by three commercial publishers and today more than half of all high school students learn their biology from the BSCS materials.

A number of college and university biology departments have been excusing from their elementary college biology course students who studied a BSCS course in high school.[23]

Adoptions It is hard to get data for comparisons over time because of (1) the different indicators selected to measure usage of materials; (2) the use of different data gathering and sampling procedures; (3) the compilation of usage data on different combinations of national curriculum projects. Nevertheless, enough time has elapsed and data gathered to indicate something about success over time.

NSF data indicate that by the 1968-69 school year more than 3.3 million students were using curriculum materials developed under NSF grants: 1.5 million in biology, .5 million in chemistry and .5 million in 9th grade physical sciences.[24] Two years later NSF claimed enrollments had grown to almost 7 million, although an Ohio State University study placed the estimate around 5.5 million: 44% of the nation's biology students, 40% of the 9th grade physical science students, 28% of the physics and the chemistry students, and 25% of earth science students. Because of later publication dates, neither the elementary science projects nor the social science materials were in wide use as yet. The mathematics programs peaked earlier in the mid 60's with an estimated 5 million students enrolled in K-12 in the two major programs.[25] It is important to note that the SMSG materials were available as such, only during the initial stages. The project made a public commitment to print copies of their materials only until there was at least one commercially available source which contained the substance of the innovations.

The most recent data for school year 1976-77 is based on a national survey of school districts, schools, and individual teachers.[26] This more recent data indicates some decline in usage of the secondary science materials, low and often declining usage of the elementary and secondary mathematics and social studies programs as well as the elementary science programs. According to the survey 35%

of grade 10-12 biology teachers surveyed reported they were using one of the three BSCS texts, only 4% of the physics teachers reported using PSSC while 10% reported using Project Physics. Only 7% of the chemistry teachers reported using CHEM study. Similar declines appear to exist in the earth and physical sciences junior high school courses. (It should be noted that some of this apparent decline might be due to the expansion of course offerings so that more students are now enrolled in advanced biology, chemistry and physics course.) Elementary science project materials now seem to be in wider use with 27% of the elementary teachers reporting use of one or more of the elementary science projects. Only about 9% of the surveyed elementary teachers and 10% of the secondary teachers reported using one or more of the math curriculum packages. School districts naturally report dropping the use of SMSG materials. About 18% of the school districts surveyed reported using SMSG in prior years, none reported using them in 1976-77. Only 11% of the elementary teachers and 22% of the high school social studies teachers reported use of one or more of the social science curricula. The most widely used elementary project was the Senesh - SRA project, Our Working World (not funded by NSF), used by 6% of the surveyed teachers. American Political Behavior produced at Indiana University, the Carnegie Mellon materials published by Holt, and the NSF funded Sociology program (SRSS, Sociological Resources for Secondary Schools) were most in use, by 12%, 10% and 7% of the districts, respectively. These social science results are a bit low compared to two other studies which nevertheless indicate low usage for most projects.[27] Turner and Haley point out that these figures for social science misrepresent actual usage because social science projects are aggregated into one category when normally the courses are taught in the specific discipline. Thus, the usage of the High School Geography Project among geography teachers is reported in one study at 28% which represented only 6% of all social studies teachers.[28]

In summary, these data give the following picture:

(1) the initial high adoption rates in secondary science is dropping off,

except possibly in biology which has both the biggest market and the highest usage.

(2) The elementary science projects have not been so successful, possibly because science is not seen as a part of the basics and because elementary school teachers are not trained in science and do not feel confident teaching it.

(3) The mathematics projects reached perhaps 5 million students in K-12 in the mid 1960's. How much of the subsequent decrease is accounted for by absorption into other published sequences is not clear, though certainly some of the decrease can be ascribed to the back to basics movement which places more stress on computational skills.

(4) The social studies projects are most successful at the secondary level, but because of the fragmented curriculum in secondary social studies, the projects are used mainly in social science classes which are a relatively small percentage of the total social studies classes. In specific disciplinary courses, like geography, which represents a small part of the curriculum, usage may run as high as 25%. Only the Senesh project made even a dent in the elementary market.

The National Survey Report confirms hunches as to the users of the curriculum projects.[29] They are mainly in the Northeast, in small city and suburban medium sized school districts, in large schools, in districts with a high per pupil expenditure and a small percentage of students qualifying for the free lunch program, and in schools where the principals (the head teacher) had attended dissemination institutes and workshops. In general except in Biology the secondary science programs benefited a limited science-career-oriented group of students and NSF supporters admit that some other students may have been turned off to further study. One NSF report states, "There seems little doubt that the benefits for bright, science-oriented, college bound students have been appreciable. On the other hand, there are strong indications that the benefits for the less bright, disadvantaged, or even bright, nonscience-oriented students have been significantly fewer and perhaps even negative in the sense that the more difficult courses have 'turned off' these students."[30]

For whatever reason, it is true that fewer students are now taking physics course than were when PSSC came onto the market in 1960.

Impact on Textbook Content. Early assessments claim that the projects became models for restructuring content and format of competing texts, and in fact that this represented an important benefit of the projects. For instance, in biology where BSCS products took over close to 50% of the market, the 1960 editions of the two best sellers in biology, which controlled 80% of the market prior to BSCS, did not cover human reproduction, population genetics, ecology, cellular metabolism, molecular biology, evolution, or race. Nor was any laboratory work integrated into the text, let alone inquiry approaches to learning. With the introduction of these subjects and methods by BSCS, the 1969 editions of the two texts included most of these innovations. Similarly for CHEM Study, in 1967 the project reported that of the 10 texts published between 1963 and 1967 'five followed the general philosophy and content of CHEM study with high fidelity. Three ... were influenced somewhat by CHEM Study ... Two ... were completely traditional in format and content."[31]

In mathematics the question of impact on content is difficult to pinpoint. Certainly in the heyday of the new math in the mid 1960's publishers quickly copied the new approach and included sets and number bases. ~~One enthusiast reported 'The content innovations K-12, the emphasis on student understanding of mathematical methods, the judicious use of powerful unifying concepts and structures, and the increased precision of mathematical expression have made substantial improvement of the school mathematics program.'~~[32] Furthermore, the new mathematics movement helped encourage the teaching of additional mathematics courses in the high schools. However, the new math content changes at the elementary level may well have been illusary. Elementary school teachers were not adequately prepared to teach the content or use the

methods imbedded in these approaches and probably continued to teach what they knew best: computation skills with whole numbers, fractions and decimals.[32] Certainly the changes in elementary texts have run their course and now have been partially superceded by the new old basics.

We are not aware of any systematic analyses of materials to look for the impact of the new social studies on textbook content. Wiley reports, "a visit to the publishers' exhibits at an annual convention of the National Council for the Social Studies leaves one with the impression that the 'new social studies' movement has had a fairly substantial impact on commercial textbook publishers. In the early 1970's many commercially developed materials resembling project materials in appearance and substance began to crop up more frequently in publishers' convention displays. However, this is only an impression: no controlled study has been done to determine whether recent publishers' products have indeed been influenced strongly by the project models."[33] Wiley also reports on an increase in content analyses of text materials since 1970, mainly as aids in textbook selection. Analyses of economics and political science texts show an updating and improvement of content in terms of standards developed by the disciplines.[34] ~~These changes may only be peripherally related to the curriculum reform movement. For instance in the case of economics, the American Economics Association, which did not avail itself of federal grant support, had been engineering these changes since 1961, in conjunction with the Joint Council on Economic Education.~~

Classroom activity and Student Learning. The evidence cited above points to limited success for the curriculum reform movement, with a few really bright break throughs. However, when one looks at what really counts, at what goes on in U.S. classrooms, the little we know is not at all reassuring. Results of a three pronged research effort to find out the status of science, mathematics and social science education in the U.S. financed by NSF have just been published, and have

provided the basis of some of the results already reported in this paper. One study is based on a national survey of school personnel.[35] The second study is a three volume review of the literature on the status of science, mathematics and social science education.[36] The third is the imaginative Case Studies in Science Education (CSSE) which combines ethnographic study of 11 school districts and a small national follow-up survey study to test hypotheses developed through the case study reseach.[37] Although the reports provide different perspectives and sometimes conflicting data, the overwhelming impression from reading them is that the classroom has changed very little since we were in school. The reports agree remarkably in the ways the schools continue to be the same. The CSSE reports document this stability most dramatically and their conclusions deserve repeating. The CSSE researchers report:[38]

(1) The teacher was key, determining what education will be for any one child. The teacher is the enabler, the inspiration, the constraint. Furthermore, though teachers might not be able to bring about the reforms a few of them think essential, they regularly stop curriculum changes they oppose.

(2) Reading and arithmetic were the basic two and the dominant influence toward change was the 'back to basics' thinking, shared by both teachers and parents. Many teachers stated that reading and arithmetic are basic because other learnings are unlikely to be efficient until the child has a thorough grounding in the basics. Practically, this means that less time is being devoted to science, math and social science concepts and relationships, particularly at the elementary level.

(3) Laboratory work in several sites seemed to be diminishing in importance because of expense, vandalism and other control problems, and the emphasis on course outcomes that would show up on tests. NSF, USOE and other funded national curriculum projects were basically absent from most of the schools studied, though some teachers had used them earlier.

(4) Social studies was primarily history and government, to some extent current social problems, and about understanding oneself. It was rarely about social science and the systematic inquiry into social phenomena. Furthermore, there was little agreement on what subject matter should be covered, little articulation between grades.

(6) In general, the science and social science curriculum in the schools was mainly a set of knowledges and skills rooted in the academic disciplines, a part of our collective wisdom, a part of culture to be learned as such.

(7) Although often teachers were friendly and warm with students, basically the curriculum was authoritarian and external - its content to be imposed on students.

(8) Socialization was a preemptive aim of schooling, in that it seemed to get immediate attention almost whenever an opportunity arose, requiring the setting aside of other learnings when necessary. Socialization practices 'impressed upon the student an observance of the community, submitting personal inclinations to the needs of the community, conforming to the role of the 'good student', and getting ready for the next rung on the education ladder.' To this end teachers practiced the principle that merit deserves special privilege, that low merit needs exposure and censure. The authors point out that to this end teachers used subject matter to keep control of the class. The new teacher learns 'what question to ask which boy to head off a prank, what homework to assign to keep the study period quiet ... Subject matter that did not fit these aims got rejected, neglected, or changed into 'something that worked.'

(9) The predominant mode of teaching was assign-recite-test-discuss - all around the subject matter included in the text. The textbook was the key to information, which helps explain why teachers consider reading to be so basic.

This vignette tells the story:

> Eight fourth-graders were circled around the teacher for their social studies lesson. Miss Williams asked, 'Why is New York City a world city? At the top of page 142, why is New York City a world city? (No answer) 'Terry?' Terry reads, 'New York City is one of the great world cities,' and looks up questioningly. 'No, look on into the paragraph. The headquarters of the United Nations is there and trade with all the countries. (Site Visit Report)'

(10) There was little real articulation among different schools in a district or across classes in a school building, but teachers supported the uniqueness of each teacher's approach as long as it did not get them all into trouble. Students must be prepared for the next grade level.

The Invention and Partial testing of a superior technology.

It is hard to ignore the CSSE conclusions, particularly since they conform to one's own casual observations of school life. Although the movement may have affected course content, we doubt that the teaching reforms have had much pervasive impact. The broader reforms in learning objectives and concommitant changes in classroom teaching and learning have not come about except in isolated schools and classrooms. Nevertheless, despite this limited success it is still important to count as one of the accomplishments the actual technological breakthrough in course design. The work of the past twenty-five years not only produced exemplary curricular packages, these materials and strategies put into practice theories of instruction and learning which worked in those classes where they were used properly. The projects and dedicated teachers using the materials have, in the words of the mathematian, provided 'existence proofs' of the possibility of teaching many specific topics and skills and constructive exemplary curricula. Successful inquiry models for learning have been developed and tried out. This body of work exists and is available for use as building blocks to more effective and practical future efforts. As curriculum developers we personally know what we accomplished.

for we have seen teachers change and students learn more using our materials. We developed substitutes for traditional schooling which concretize John Dewey's 60 year old prescription of effective education. We attempted and to a large extent created curriculum packages which incorporate the following:

— carefully delineated learning objectives including objectives to raise students' cognitive, moral, emotional and social levels of functioning;

— content choices based on powerful conceptual and analytical structures of knowledge and on a sampling of facts, cases, events which illustrate parts of the structure and expand student experience;

— appropriate sequencing and spiralling of appropriate sized learning activites;

— rotation of learning activities in learnable steps to permit assimilation of and accommodation to new knowledge;

— design of effective learning experiences which require active student involvement and allow them to acquire and practice necessary skills, to use and extend their knowledge, to clarify and build their system of beliefs;

— design of activities which motivate students to learn, which are interesting and captivating because they work simultaneously on the achievement of multiple objectives;

— the use of systematic and continual feedback to students on their learning progress through tests and other evaluation procedures;

— the training and inspiring of teachers to change their behaviour and their functions in the classroom - to move away from lecturing and controlling toward managing, diagnosing, adapting, inventing, inspiring.

The projects were also an important training ground. One estimate is that 5000 of us were involved in curriculum development.[39] In addition there were thousands of teachers who have adapted the materials and methods to their own teaching style. Hopefully, many of them are still teaching! In addition Wiley reports a California study indicating considerable general awareness

among social studies teachers of the new social studies teaching strategies and a reasonable amount of interest in learning to use them.[40] Finally, even academic disciplinarians involved in the projects learned something about teaching to take back to their mostly ungrateful departments but more grateful students.

Shifting National Priorities and Professional Criticisms By 1970 most of the first round of federally funded curriculum projects had been published, available for use and for criticism by professional educators. The buoyant 60's were history. Rising inflation rates warned of the waning effectiveness of Keynesian economic policy. The civil rights movement, Vietnam, student revolt, urban blight, internal and external liberation movements had created a moral crisis some of us saw epitomized in President Nixon and Vice President Agnew. ~~conspiracies~~. Support for education took a sudden turn for the worse as elementary enrollments began to decline from their 1969 high of 32.6 million, and as an oversupply of the college educated and falling rates of return on college education began to be predicted. Poor and middle class parents began demanding greater control over local schools; national assessment data ~~began~~ documented declines in basic skills; fiscal crises in the great urban centers further undermined urban education. The nation's educational priorities shifted abruptly and detractors of the curriculum reform movement from within professional education escalated their attack. Suddenly, it seemed, we were on the defensive. The reforms were being discounted as outdated and elitist; the best for the brightest simply wouldn't solve the more ominous social problems of the 70's.

Actually, within the schools of education and among professional teacher educators there had been apprehension and opposition to the new curriculum efforts from the very beginning.[41] As the times changed and the materials

came into use, this opposition gained force. At least in social sciences it has written an epitaph of the "New Social Studies". Most of the evaluations and assessments of the new materials have been written by professional educators, most of whom had at least some disagreement with the curriculum developers. Writing these assessments in the guise of objectivity they have created a whole "analysis" which is now taken as fact, which in many ways represents a caricature and distortion of the movement and its accomplishment. A myth has grown up as a new gospel, which we feel does damage to history and makes the accomplishments of the movement less accessible for future study and use. As social scientists, naive about history, we suffer a certain amount of outrage.

Or, perhaps we are learning something about the process by which a real, live movement for social change gets transformed into history and finally forgotten. Possibly historical analysis, as abstraction from reality, must oversimplify, distort, make static and describable a complex stream of past life. The analyst/critic necessarily looks for similarities and differences, for cause and effect, for reasons why; he looks for patterns and boundaries so as to define a movement, sets up categories, transforms the real life events into an abstract model. The participants in the actual drama will see these 'analyses' and 'histories' as painfully deficient, much less than the real life they experienced.

Wiley summarizes the literature which evaluates, criticizes, and 'places in perspective' the 'New Social Studies' movement.[42] She collects and lists the analysts' statements of major characteristics of the projects, their disagreements as to these characteristics, and their views of the weaknesses of the projects. Although the report identifies contradictory evaluations, the long lists of characteristics and deficiencies give a mistakenly static and unified view of a movement which was dynamic and diverse and which even learned from its own

experience. Wiley identifies only isolated individuals who point out the simultaneous existence of different reform thrusts, and who recognize some development or evolution over time based on earlier experience. The literature review, taken as a whole, reads like a shallow, unfriendly postmortem; it lifts the understanding of 'the New Social Studies' to a new level of abstraction by summarizing the earlier hostile summaries. (Ironically, the Wiley review was financed by the National Science Foundation as an attempt by the Foundation to get on top of the burdgeoning literature.) Thus, the curriculum materials and innovations fade into several pages of lists of characteristics and weaknesses, shortly to fade from memory entirely.

For the record, we want to single out four types of criticisms of the 'New Social Studies' projects which either misrepresent the movement or create misunderstandings of characteristics which were central to it (but which were not necessarily characteristic of all projects).

1. Criticisms of the Inquiry/Discovery/Inductive Method. "The inquiry method, as used in the 'New Social Studies', is really seduction rather than induction. Closed-ended 'discovery' activities tend to dominate. Students really are being asked to sleuth out what are the teacher's (or materials') preconceived notions, using prearranged data packages ..... Most materials are still stuck in the 'right answer' rut. ..... There is too little attention to instructional strategies other than inquiry methods. There seems to be an unquestioned assumption that the social scientists methods are appropriate for children. Such methods have serious limitations and there are many other ways in which children can and do learn"[43]

These criticisms create the impression that the 'discovery' strategies in the natural and physical sciences were mindlessly adopted in social studies and that nothing was learned about using inquiry strategies during the decade

or more of curriculum development. While a few of the early projects may have emphasized teaching children to think and inquire like historians, gradually the projects developed a variety of inquiry strategies to help students to learn to think productively, using those aspects of scientific inquiry which are fundamentally practical and useful. The projects did not use scientific inquiry to the exclusion of other ways of coming to know. If anything, they engaged students in activities which demonstrated the similarities between scientific thinking and other rational thought processes. Some projects branched out of inductive inquiry to incorporate deductive inquiry as well. Project staff even learned that students don't like to have to inquire all the time and generally followed a strategy which mixed instructional methods, even resorting to didactics in the form of texts, programmed instruction and lectures.

We feel it would be more accurate to say that the projects investigated a range of inquiry strategies and after many false starts and partial successes, helped to develop specific strategies which are highly successful in many classrooms. By the end of the period we knew much more about the variety of inquiry strategies, their function in the teaching-learning process, their relationship to other learning paradigms.

2. Criticisms of the disciplinarian orientation and the application of the discipline structure to social studies. "The 'New Social Studies' .... have the possibly mistaken notion that there is something identifiable as 'the structure of the discipline' for each of the social sciences and that this structure is what should be taught in the social studies."[44]

To us, the debate over the use of the structure of the discipline as a basis for content choice is one of the most confused and important issues raised by critics. First, however, it is important to note that these critics are speaking of only one set of the new social studies materials - mainly the high

school projects sponsored by NSF. Except for Senesh's work the elementary projects did not use the discipline structure approach. Second, just as in the case of experimentation with inquiry teaching strategies, our understanding of the meaning and function in curriculum work of the discipline structure changed as project staff gained experience.

The notion of <u>the</u> structure of a discipline, as used by professional educators seems to be that scientists act on the idea that there is some set of underlying principles, laws, theories, generalizations, tools of scientific inquiry whose interrelations form a structure and imply a logical ordering and hierarchy of knowledge of the discipline. Much of the educators' discussion about structure of a discipline has centered around the article 'the'. Possibly this is a reaction to Bruner's discussion in <u>The Process of Education</u>, possibly it is based on Schwab's early articles on the subject.[45] This point of view does not reflect the thinking of discipline oriented curriculum developers like Senesh and Helburn who used discipline structures as an important curriculum component.[46] Our approach was mainly pragmatic; we developed <u>a</u> structure <u>from</u> the discipline useful for the curriculum we were developing. Possibly we were a bit romantic and overly zealous about the importance of ideas in the curriculum (we think not), but we were looking for a way to empower children. We were trying to identify insights and knowledge youngsters need to know in order to know their world. As disciplinarians we were captivated by what our respective disciplines had to offer to the common person, but we had no illusions about finding <u>the</u> structure of our discipline. Some of us were even critical of our own discipline's established theoretical paradigms. Many of us had been influenced by educational psychologists who introduced us to theories of cognition and of intellectual development, to the view that the job of the teacher is to help the child develop a more powerful cognitive structure through the process of differentiation and integration that goes on as the learner confronts new events and encounters discrepencies between what he/she knows and what she/he needs to know to make sense of the event.[47] Our goal, as we saw it was to help children and

adolescents incorporate some version of the curriculum's conceptual structure and inquiry methods (structure of the discipline) into their own continually developing cognitive structure. Thus, we were quite aware that each person has a unique cognitive structure; we were trying to get students to revise theirs in the direction of the powerful ideas imbedded in the curriculum. That is, we used the structure idea for practical purposes: (1) to help narrow down knowledge objectives to really important concepts, ideas, theories, relationships which have great explanatory power in helping students understand society; (2) in this way to focus student learning and to help them develop their own mental structure of the discipline which they learn to apply because of its practical usefulness to them; (3) to help us choose relevant facts and events, and learning activities which illustrate or in some way demonstrate the relevance of some part of the discipline structure to the real world; (4) to help train teachers in the subject matter by informing them quickly of the major ideas imbedded in the curriculum; (5) sometimes to illustrate concretely to older students the nature of the discipline.

These discipline structures were used mainly in courses which were organized as introductions to the given disciplines; they were courses in geography, sociology, anthroplogy, economics. In many ways the discipline structure approach represents a radical departure from traditional approaches to introducing students to these disciplines, which is to load students down with the whole set of principles and theories, layed out in some 'logical' sequence which suits the fancy of the instructor or textbook author. In the curriculum projects, the need was to limit content to powerful (useful) ideas and connections and to organize the learning sequence so as to be pedagogically sound, that is, to take into consideration students' maturation levels, individual differences, degrees of interest in the subject.

3. Criticisms about the Narrowness of the Disciplinary Approach. "The 'New Social Studies' developers have ignored sources of the curriculum other than the social science disciplines. The nature of society, its needs problems, and characteristics, is one such source largely ignored. The content chosen ..... displays a low social consciousness. For instance, the disciplines offer little in the areas of decision-making skills, thought-process skills, feelings and attitudes, and value conflicts and commitments. Social science deals with descriptions of reality, not questions of prescriptions .... The new social studies does not give sufficient attention to normative and affective matters, which are central to any understanding of human affairs."[48]

This sort of criticism is hard to pin down because it is difficult to judge what is 'enough'. The discipline oriented projects at the secondary level did incorporate real world problems, decision making, values dilemmas, public policy controversy. Some projects made these a central concern. Values were at the core of all the elementary social studies projects, perhaps even too much so, at least insofar as they conflicted with community beliefs. Here another criticism cited by Wiley seems to be more accurate. "The new social studies teach value relativism and appear to advocate values that are diametrically opposed to those on which our society is based " (namely, scientific values, belief in rational problem solving and conflict resolution).[49] If anything, it seems to us that in opening up the classroom to debate or discussion of beliefs which many families want to control themselves, the project staffs overestimated the extent to which belief in rationality and scientific scepticism are an important part of most people's values. Certainly MACOS ventured into territory which some families consider to be their personal domain.

Analysts' criticisms of the limitations of discipline-oriented curricula, because social sciences only deal with describing reality, is more a criticism of university academics than of the curricular materials developed on the projects.

The curriculum designers, aware that they were designing materials to fit into the social studies curriculum, broadened their scope of concern to meet the goals of citizenship education.

4. Criticisms related to the Needs and Characteristics of Students.

"The 'New Social Studies' did not pay sufficient attention to the needs and characteristics of students ..... (They) neglected cognitive and moral stages of development, ... the needs and interests of the child as one possible source of the curriculum.[50]

Again, the accuracy of this criticism depends upon the weight one attaches to 'sufficient'. Certainly, all projects took into consideration the needs and characteristics of students. The materials were developed using school trials and the schools chosen were representative of different geographic, socio-economic and urban-rural settings. The Taba elementary materials eventually published by Addison Wesley were based on over ten years of action research on the cognitive and moral stages of development of children. The early secondary projects tended to gear materials to average and above average students, so the claim that they neglected the special problems of inner-city students is partially true. Nevertheless, we question the generally agreed to conclusion that the project curricula were too sophisticated for the maturity level of students.[51] It seems mainly to be based on teacher feedback after using the materials unsuccessfully or after rejecting them for adoption. It contradicts project formative evaluation results which indicated that students could do the work and generally enjoyed it (that is, the project evaluations proved the "existence theorems").

Given the information about teachers and their needs and expectations as described in the recent NSF status studies cited above, it is quite understandable that many teachers judged the materials to be too

sophisticated, but this judgement should not be accepted at face value. As pointed out earlier in this paper, the CSSE researchers concluded from their case studies that in the schools they found learning to be mostly book learning; children and youth being disciplined to learn expeditiously the subject matter presented in the text. Teachers believed pupils must learn to read, follow directions, complete written work properly before they are ready to do more independent, higher order intellectual work. The new materials obviously flew in the face of these attitudes and, as the CSSE authors say, were rejected, neglected, or changed into 'something that worked.'

CSSE findings suggest that the misfit is not so much between materials/strategies and student maturity levels as it is between the materials/strategies and teacher goals and practices. If course content and teaching methods form part of the means for controlling students, for preparing them for passage to the next grade and teacher, and for rewarding and punishing them - then it is quite understandable that the new materials did not fit into teacher needs in most cases. For example, narrowing content focus to a conceptual structure which all students could learn, instead of requiring students to recall everything in the text, reduces the ability of the teacher to use content as a weapon or at least as a basis for differentiated grading. Opening up the classroom to inquiry and values clarification detracts from the text and teacher as final sources of knowledge and creates classroom opportunities for all manner of values disputes or issues not normally considered there. How can a teacher who considers it appropriate and right to inculcate knowledge about society as recorded in the text feel comfortable or even justified in converting to the philosophy of education embodied in the inquiry mode? Thought of in this context, it may well be true that social science is not the appropriate content base for social studies (citizenship education) which as part of the general education requirements, performs important socializing functions in the broader school curriculum.

Public Criticism

External criticism and the fear of same formed part the internal politics of curriculum program development and budget allocation within NSF. Science research always looked askance at wasting limited funds on science education. Natural scientists questioned the appropriateness of social science. Within science education, how much should go for curriculum development? how much for teacher education? and of the latter how much to encourage the adoption of NSF developed materials? Factions in the congress took sides.

Public criticism of the new curriculum materials probably had existed from the beginning. Any rapid change increases the sense of generation gap. "Schools aren't what they used to be" is seldom said with a laudatory connotation. The changed terminology of the new math left parents unable to help children with their arithmetic homework. But it was senior high school biology and middle school social science which generated the explosive criticism in the mid-seventies, an explosion which was to destroy the momentum of the curriculum development movement and bring to an end the era of development which flowered in the sixties.

From the very beginning, biologists were concerned about controversial topics. The omission of evolution and human reproduction from American high school texts was one of the major failings to which BSCS dedicated itself. The omissions were not accidental, but the result of the normal response of the publishing industry to a value conflict. Even though only a minority of Americans objected to their inclusion, the fact that they would make a public outcry about these topics caused them to be omitted. The crucial test came with the approval of BSCS texts for statewide use in Texas, the largest population in the traditional 'Bible' belt. The Biologists and the reformers presented a united front and, in the enthusiasm of the 60's, prevailed. Traditionalists continued with another strategy, insisting on 'equal time'. By the early 1970's they were securing legislative or administrative mandates

requiring the teaching of 'special creation' as an alternative explanation.[52] The criticism of teaching 'godlessness' continued. In 1974 when another project, Individualized Science Instructional System, (ISIS), more vulnerable in its design and management, left evolution and sexual reproduction exposed as individual modules, the whole attack was renewed: on the modules, on the project, on curriculum development, on NSF itself.

The effective eruption of criticism took place in 1975 and 1976. Issues of public intervention in business and local control of education aggravated the situation, but in the opinion of the authors, the nexus was a value controversy. The ISIS project was implicated too, but the focus was Man, A Course of Study, (MACOS). For a decade the material had been developing at the Educational Development Center (EDC) in Massachusetts under the general guidance of the prestigious Jerome Bruner. The commitment to inquiry was so profound that EDC would not agree to publication unless the publisher would agree to provide in-service training for the teachers who were to use it. Using unusually effective films of salmon, herring gulls and eskimos, teachers guided children in the exploration of what is human about human beings. They dealt directly with the care of the young and behavior within the family. School systems adopting the materials held public hearings and secured agreement from parents and teachers. The satisfaction level was high.[53]

The attack on MACOS was led by conservative Representative John Conlan of Phoenix, Arizona where the school system had started to use the project materials. He played upon the fear of government invading the proper sphere of business by subsidizing the development and diffusion of textbooks and other educational materials. He played upon the issue of local control of schools by asserting that NSF was exerting undue influence on local school districts, both by subsidizing the original development and by restricting teacher education funds to programs using NSF developed curriculum materials. This

criticism has an ironic twist, since it was efficiency-minded management experts of the conservative Nixon administration who insisted that teacher education funds be used to further the adoption of the projects in which so many Federal dollars had been invested. In doing so they left NSF vulnerable to the charge of fostering 'a national curriculum'.[54]

Representative Conlan and the other critics probably could not have developed much public interest on these issues without the values controversy. Wiley quotes Conlan in the US Congress in April, 1975:

> Mr. Chairman, MACOS materials are full of references to adultery, cannibalism, killing female babies and old people, trial marriages and wife swapping, violent murder, and other abhorent behavior of the virtually extinct Netsilik Eskimo subculture the children study.
>
> Communal living, elimination of the weak and elderly in society, sexual permissiveness and promiscuity, violence, and other revolting behavior are recurring MACOS themes.
>
> This is simply not the kind of material Congress or any Federal agency should be promoting and marketing with taxpayers' money.[55]

Clearly children were not being indoctrinated to favour adultery, cannabalism, killing female babies, and the like. But children were learning that salmon lay many eggs and do not take care of their young. Any they would be aware of the nesting behavior of herring gulls. And they would discuss the conditions which might force a Netslik eskimo family to favor a boy child over a girl child. And they might even be brought to reflect upon relations between parents and children in their own homes.

For a substantial minority of Americans traditional values about religion, family, and sex are a closed subject. Analysis or discussion of them is taboo. Inclusion of these topics in the curriculum of public, compulsory school is for them a violation of the sanctity of the family.

Backed by the emotional force of the values controversy, Representative Conlan was able to endanger (or at least to appear to endanger) the whole budget of NSF, research funds as well as education funds. Guy Stever, the director of NSF caved in quickly, promising that funds were being stopped for MACOS and that no new funds would be allocated to it or similar projects until all doubts were satisfied. In the continuing attacks, investigations and program reviews, the morale and prestige of the curriculum development staff at NSF was destroyed. Some projects continued, but the momentum had been lost. An era had come to an end.

Conclusions

Let us sum up the previous discussion about the impact of the curriculum reform push of the 1960's and early 1970's.

1. Secondary Science and Mathematics. The NSF financed projects directly or indirectly brought about significant changes in course content and coverage in the science and mathematics, updating and expanding subject matter coverage so that more science and mathematics is taught in any one course and more courses are offered. However, in science fewer students are being reached by these courses, except in biology (where the greatest success was probably scored), so the benefits of the projects are mainly felt by the college-bound future scientists. There continues to be an expansion in mathematics enrollments as well as in course offerings, probably due more to expanding job opportunities for the mathematically trained than to the curriculum movement. Nevertheless, the curriculum reforms might well have enriched the teaching of this growing group of students.

2. Elementary Science and Mathematics. The elementary science projects materials, though widely distributed, are not in widespread use by a large percentage of elementary teachers. Science teaching, in fact, is being squeezed in the elementary curriculum to make more room for the back-to-basics subjects. The content of the 'new math', made an enormous impact on textbook content, but has now been superceded by the back-to-basics push on teaching computational skills. Possibly, in terms of actual classroom practice, the 'new math' never did have much impact if it is true that teachers were never adequately prepared to use the methods inherent in the content revolution.

3. Elementary Social Studies. Elementary social studies project materials have not sold well, with the possible exception of the Senesh materials which are now in the process of revision by the publisher, SRA, without Senesh's participation (the publisher is revising to meet their conception of popular demand rather than to meet the author's judgments about revisions). The Taba curriculum embodied a profound change in teacher behaviour, a teacher commitment to change which, understandably, many school districts are relatively uninterested in, given the more pressing public demands for accountability and reading and computation skills.

4. Secondary Social Studies. Secondary social studies is still dominated by courses in history, to a lesser extent government, geography at the junior high school level, and electives and American Problems at the 12th grade level. Most curriculum projects created courses in individual social science disciplines useful mainly in electives (the National Science Foundation, a major funding agency, only finances science education which by their definition excludes most history and government/civics courses). Project staff hoped that superior materials in specific social science disciplines would influence schools to shift away from the traditional social studies history emphasis towards the social sciences, but this shift did not occur. ~~(although there has been some increase in enrollments in sociology and psychology,~~

Significantly, the most commercially successful materials were those in history developed by Fenton at Carnegie Mellon and in government, American Political Behavior, by Mehlinger at Indiana University.

5. Advancements in Technology of Curriculum Development. The projects demonstrated that high quality curriculum material could be produced for American schools. Materials could be designed and published that could be handled by teachers of intelligence and good will without much special training, that helped students to master concepts and cognitive skills considered important by the scholarly disciplines and important to critical thinking, in contexts which seemed realistic and relevant to students, while encouraging the clarification of their values and contributing to their moral development. The projects thereby demonstrated the 'existence theorems'.

6. Significant Impediments to Diffusion. The experience demonstrated that national curriculum projects require time and significant funding, the benefits of which are only forthcoming if the projects are actually installed in the schools and in the hands of teachers who enthusiastically endorse the aims of the curriculum. Any such project carried out to its conclusion bears a remarkable resemblance to a 'national curriculum' in the given subject, at least to its detractors, and is likely to activate effective opposition inside and outside education.

Major Impacts on the U.S. Curriculum. If the curriculum reform movement made only modest changes in what is taught and how classroom teaching takes place, what then have been the major influences on public school curriculum in the postwar period? After reviewing the history and sifting through the many evaluations, we agree with the authors of the CSSE report

that the important changes in curriculum in the past twenty years came, not from curriculum reform, but from the changes in the legal framework and in the social setting in which schools operate, due to the continued attempts by localities and the Federal government, acting on the behalf of the citizenry, to try to solve social problems through the schools. The CSSE report lists the following influences:[56]

1. the effect on curriculum of state/federal funding of categorical block programs for compensatory education, vocational education, etc. which affects curriculum directly and adds to administrative burdens, taking supervisory personnel away from their service function to teachers;
2. the effect of bussing and other integration schemes, of providing equal opportunity through mainstreaming which increases the time teachers spend keeping order and control in the classroom;
3. the effects of accountability requirements in setting minimum testable standards of learning that all too often become the standards;
4. the effects of the back-to-basics movement which has made science and social studies lower priority goals, reducing time and resources for these subjects;
5. the expansion of testing which moves instruction increasingly to test-item related learning and involves administrators, teachers and students increasingly in the administration and evaluation of tests.

Education policy makers in Washington are becoming increasingly aware of the limits of externally imposed school reform. Gardner, in her [redacted] history of Federal involvment in Curriculum Development, quotes conclusions of a recent Rand Corporation study on the requirements for successful reform: (1) a receptive institutional setting is a necessary but not a sufficient condition for implementation; (2) it is critical that the implementation strategy promote mutual adaptation; (3) the best approach to change is to find a local need,

and seek to satisfy it innovatively if possible.[57] That is, the experts become resource persons for locally conceived change projects. On this advice, evidently, USOE is planning to fund a system of teacher centres throughout the U.S. Interestingly, the CSSE authors make similar recommendations to NSF.

This conclusion derives logically from the evidence and is an admission that profound and pervasive changes in school curriculum and teaching practice based on liberal ideals about the purpose of education will not work in U.S. society as presently constituted. Changes which do occur may be the result of innovations developed through national research and development efforts, but to be installed in the schools they must be known by teachers; it must be readily obvious that they satisfy the needs of teachers and be picked up and translated into use by these teachers.

The BSCS (Biological Sciences Curriculum Studies) program may be an important exception and a useful exemplar of appropriate organization for future curriculum reform efforts. BSCS succeeded in capturing perhaps one half of the high school 10th grade biology market in its hey day, and since has gone on to other course construction efforts where biology is part of the curriculum. From the beginning BSCS leadership recognized the need to create a permanent, well funded national organization which would both produce materials and disseminate them in conjunction with any number of commercial publishers. This organizational structure provided a permanent power base for promoting and defending project work, a long-run policy which may be essential, but which is not easily replicable in today's political environment.

The Limits of Curriculum Reform. The limits of curriculum reform can best be understood in the broader context of the forces promoting change and development of education as a whole. Furthermore, education should be seen in a still

larger framework as part of capitalist social and economic development. Projecting our curriculum experience and the conclusions of this paper on this larger social fabric results in the following major, but tentative points:

1. Revisionist historians of education have begun to reinterpret the development of urban public education in the Eastern United States in the 19th century. In their view community leaders, members of the middle and propertied classes, introduced and often imposed free public education on an unwilling public as a way of socializing lower class (mainly immigrant) children, and of providing for upward mobility for middle class children whose families could not afford to send them to private academies for secondary education. Community leaders saw public education as the means of overcoming the negative effects of industrialization, urbanization and family disintigration among the newly developing and rapidly growing working class. They saw free public education as the key to social uplift. As publicly controlled agencies, the schools could do what the working class families could not do - inculcate the poor with acceptable social attitudes, and even, for the more talented children, provide a way out of the working class. These authors contend that the schools always have been controlled by the upstanding sections of the community, that a wide gulf between the working class communities and the schools developed early and has persisted and intensified over time.[58]

2. From the mid 19th century in Massachusetts to the most recent upsurge of curriculum reform there has been an internal dispute between schoolmen (teachers and masters, more recently professional administrators as well) and lay school committees, boards, etc. on the correct methods of instruction. In the 1850's the hard-line schoolmen defended their authoritarian methods against Horace Mann, Secretary of the Massachusetts Board of Education, and his colleagues who contended that the new conditions required innovative pedagogy stressing a structuring of lessons around student interests and student observations of natural phenomena,

schooling related to the real world, avoidance of corporal punishment, development of friendly relations between students and teachers, etc.[59] In this earliest dispute the soft-line won out in terms of control of public policy, though probably not in terms of actual classroom practice. Katz maintains that the really important changes during the late 19th century and early 20th century - the professionalization of school personnel; the bureaucratization (and centralization) or school administration; the introduction of vocational training in high schools, of kindergartens, of ability grouping, of the junior high school, of social studies, of guidance and testing - all continued to satisfy the needs of the elites in serving as a source of social order, stability and inculcation of acceptable values.[60]

3. In the U.S. today, a new dimension has been added as minority groups have gained some access to power. The disruptions of the 1960's and the rising expectations of underpriviliged and underepresented groups demanding economic justice, impacted heavily on the schools, and created a major turnabout in education policy. This political shift, demographic shifts, and increasing fiscal problems have created the new pressures on schools described earlier. They have taken precedence over more traditional curriculum concerns, but they have not, on the whole, improved education for the disadvantaged groups. If anything, they have created new contradictions to be overcome.

4. Looked at in relation to the development of human capital, the schools provide general skills for new entrants into a differentiated labor force, as well as socialization into work roles in an advanced capitalist society. Schools help determine the distribution of these skills among new labor force entrants through testing programs, grades and student acceptance of the school incentive system. They help future labor force participants and future welfare recipents fit into their places in the meritocracy.

5. Not all people need to develop their human potental in U.S. society. In

fact, it is positively dysfunctional to social order if they do because the society does not provide enough satisfying work to absorb those so educated. Over-education breeds discontent. There is some evidence for this ~~hungary~~ in the U.S. with the recent oversupply of college graduates. The system can adapt by raising job requirements beyond what is actually necessary for the work, however this can create on-the-job dissatisfaction.[61] In the long run stability is fostered by a balance between the supply and demand for skills.

6. Only curriculum reforms appropriate to the real functions of the schools in U.S. society will ~~take hold widely~~ be widely diffused. These have tended to be in vocational and career education, in testing for screening into higher education, in early childhood development and in the extension of the number of years of education. The curriculum projects discussed in this paper were useful in-so-far as they fulfilled important career education needs in science and mathematics. However, Social studies ~~in the schools is~~ courses are part of general education, and only a few courses can be considered as preparation or training for future professional work. Innovations attempting to elevate student abilities to think, their curiosity, their level of moral functioning tended to catch on where they were most useful - in middle and upper middle class schools. They were generally inappropriate in the slums. There most children do not need to improve their cognitive abilities; they know it, their teachers know it, their principals know it, their parents know it. They need to learn to read, write, figure, be respectful, look neat, be prompt, adopt acceptable manners. They probably will not have to think much on their future jobs; too much thinking might create psychological problems or social unrest.

7. There have been idealists in and out of education for 150 years trying to humanize the schools. They never have made much headway, though they have been blamed for increasing permissiveness and declining test scores. ~~They never had much chance.~~ The school system, developing in reaction to the social system's needs, defeats their efforts and creates the low test scores. Schools as a whole won't pursue goals aimed at developing human potential in all its pupils unless or until society needs all its citizens to be so developed.

8. Nevertheless, some of us continue to develop the technology, the rationale and the critique of the system within the existing state of affairs, thus hoping to contribute to the dialectics of change. We think that this growing knowledge of how children learn, what they can learn, how to encourage this learning, how and why the existing social and educational system selectively discourages such learning - will be useful in bringing about a more just and humane world. It is essential to continue to develop the techniques for such wide range upgrading of children's education; it is equally important to continue to gather evidence as to the success of these techniques but the limited possibilities for their diffusion in the existing society. Our view of social change holds that radical change is necessary, but develops out of growing public dissatisfaction with current institutional arrangements and intensified demands for change based on their awareness of the discrepency between actual practice and what is known to be possible.

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